CLAIMS

What is claimed is:

1. An apparatus for controlling timing of a reverse link signal from a subscriber unit in a multi-path environment, the apparatus comprising:

a receiver in a base station that receives a reverse link signal, including a common code and a unique orthogonal code, that travels on a primary path and at least one secondary path from a given subscriber unit to the base station and is received as a like number of reverse link signals, each including the common code and unique orthogonal codes;

a correlator coupled to the receiver that associates a metric with each of the received reverse link signals;

a selector coupled to the correlator that selects the received reverse link signal associated with a best metric; and

a timing controller coupled to the selector that determines a gross timing offset of the selected reverse link signal to align the selected reverse link signal with reverse link signals from other subscriber units using the common code with a common phase but using unique orthogonal codes.

2. The apparatus according to Claim 1 wherein the timing controller determines a fine timing offset and causes a fine phase adjustment of the common code of the selected reverse link signal.

3. The apparatus according to Claim 1 wherein the timing controller provides the gross timing offsets to the subscriber unit in the form of a timing command.

4. The apparatus according to Claim 1 wherein the timing controller provides the gross timing offsets to the subscriber unit in the form of a timing report.

5. The apparatus according to Claim 1 wherein the selector determines whether a reception quality criterion is met and, if met, causes the orthogonal timing controller to align an unaligned reverse link signal from the given subscriber unit with reverse link signals from other subscriber units.

6. The apparatus according to Claim 5 wherein the reception quality criterion includes at least one of the following: (a) the metric of an un-aligned reverse link signal exceeds a threshold for a predetermined timespan, (b) the metric of an un-aligned reverse link signal exceeds a threshold relative to the best metric for a predetermined timespan, (c) the best metric drops below an absolute metric, and (d) the metric of an un-aligned reverse link signal exceeds an absolute metric.

7. The apparatus according to Claim 6 wherein the metrics include at least one of the following: (a) power, (b) SNR, (c) variance of the power, (d) variance of the SNR, (e) relative ratio of the power, SNR, or variance of two paths, (f) bit error rate, and (g) energy per chip divided by the interference density (Ec/Io).

8. The apparatus according to Claim 1 further including a power controller that determines a power level of the aligned reverse link signal and provides feedback of the power level to the subscriber unit.

9. The apparatus according to Claim 8 wherein the power controller provides the power level to the subscriber unit in the form of a power command.

10. The apparatus according to Claim 8 wherein the power controller provides the power level to the subscriber unit in the form of a power report.

11. A method of controlling timing of a signal from a subscriber unit in a reverse link in a multi-path environment, the method comprising:

receiving a reverse link signal, including a common orthogonal long code and a unique orthogonal code, that travels on a primary path and at least one secondary path from a given subscriber unit to the base station over a reverse link and received as a like number of reverse link signals, each including the common and unique orthogonal codes;

associating a metric with each of the received reverse link signals;

selecting the received reverse link signal associated with a best metric; and

determining a gross timing offset of the selected reverse link signal to align the selected reverse link signal with reverse link signals from other subscriber units using the common code with a common phase but using unique orthogonal codes.

12. The method according to Claim 11 further including determining a fine timing offset and causing a fine phase adjustment of the common code of the selected reverse link signal.

13. The method according to Claim 11 further including providing gross timing offsets to the subscriber unit in the form of a timing command.

14. The method according to Claim 11 further including providing the gross timing offsets to the subscriber unit in the form of a timing report.

15. The method according to Claim 11 further including determining whether a reception quality criterion is met and, if met, causing the orthogonal timing controller to align an un-aligned reverse link signal from the given subscriber unit with reverse link signals from other subscriber units.

16. The method according to Claim 15 wherein the reception quality criterion includes at least one of the following: (a) the metric of an un-aligned reverse link signal exceeds a threshold for a predetermined timespan, (b) the metric of an un-aligned reverse link signal exceeds a threshold relative to the primary path for a predetermined timespan, (c) the metric of the primary path drops below an absolute metric, and (d) the metric of an un-aligned reverse link signal exceeds an absolute metric.

17. The method according to Claim 16 wherein the metrics include at least one of the following: (a) power, (b) SNR, (c) variance of the power, (d) variance of the SNR, (e) relative ratio of the power, SNR, or variance of two paths, (f) bit error rate, and (g) energy per chip divided by the interference density (Ec/Io).

18. The method according to Claim 11 further including determining a power level of the aligned reverse link signal and providing feedback of the power level to the subscriber unit.

19. The method according to Claim 18 wherein providing the power level to send to the subscriber unit includes transmitting the power level feedback to the subscriber unit in the form of a power command.

20. The method according to Claim 18 wherein providing the power level to send to the subscriber unit includes transmitting the power level feedback to the subscriber unit in the form of a power report.

21. An apparatus for controlling timing of a reverse link signal from a subscriber unit, the apparatus comprising:

means for receiving a reverse link signal, including a common code and a unique orthogonal code, that travels on a primary path

and at least one secondary path from a given subscriber unit to the base station over a reverse link and received as a like number of reverse link signals, each including the common code and unique orthogonal codes;

means for associating a metric with each of the received reverse link signals;

means for selecting the received reverse link signal associated with a best metric; and

means for determining a gross timing offset of the selected reverse link signal to align the selected reverse link signal with reverse link signals from other subscriber units using the common code with a common phase but using unique orthogonal codes.